

AIR QUALITY ELEMENT

4.7 INTRODUCTION

The community values clean air. To promote clean air, the City, in partnership with State and Federal responsible agencies establishes goals and policies to retain and improve the region's air quality. The City emphasizes land use practices, permitting, and programs that reduce introduction of airborne pollutants. While the Air Quality Element is a mandatory General Plan Element pursuant to state law, the City of Arcata is committed to maintaining the quality of life that we all benefit from by implementing proactive air quality policy and standards.

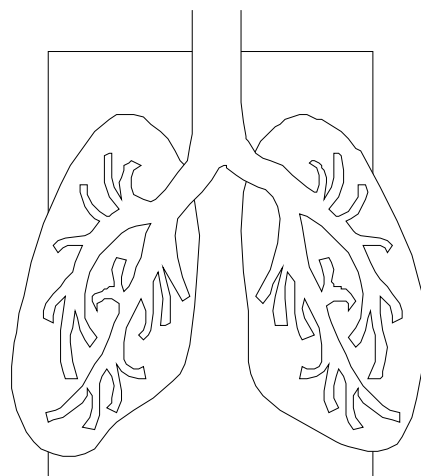
Guiding Principles and Goals.

- A. Reduce motor vehicle related air pollution.
- B. Participate in regional efforts to improve air quality.
- C. Educate the community about the effects of air pollution and how they can be reduced.
- D. Reduce emissions from wood-burning stoves and fireplaces.
- E. Reduce emissions from forest management and burning.
- F. Reduce emissions from industrial sources.
- G. Reduce emissions from residential open waste burning.

Overview of factors contributing to air pollution. One of the best ways to control air pollution is to develop transportation infrastructure and land use goals and policies that complement, and work in harmony towards, air pollution control objectives. Activities affecting air quality in the City of Arcata are regulated by the North Coast Unified Air Quality Management District (District). The District's primary responsibility is to achieve and maintain federal and state air quality standards. Humboldt County is located in the North Coast Air Basin (Basin), which includes Del Norte, Humboldt, Mendocino, and Trinity Counties, as well as the northern and western portion of Sonoma County. The District oversees Humboldt, Del Norte, and Trinity Counties. The District's region currently meets all federal standards but is classified as non-attainment (exceeds maximum limits) for California Ambient Air Quality Standards for airborne particles that are ten microns in diameter and smaller (PM-10) for exceedances of the 24-hour standard.

Federal and state ambient air quality standards also include ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, and lead. Of these pollutants, motor vehicles are a major contributor of carbon monoxide, nitrogen dioxides, and ozone. While engine and fuel improvements have significantly reduced these emissions from motor vehicles, measures to reduce vehicle travel can further improve air quality from these pollutants.

Particulate matter includes a wide range of solid or liquid particles including smoke, dust, aerosols, and metallic oxides. Significant sources of PM-10 in the Basin include transportation (road dust, mobile sources), woodstoves, open burning, and a minor contribution from permitted sources (District 2022). Stationary sources include Humboldt Sawmill Company (Scotia), the PG&E Humboldt Bay Generating Station (Eureka), and the DG Fairhaven Power Plant (Fairhaven). PM-10 emissions associated with motor vehicles include vehicle exhaust and tire and brake wear. Because road dust sources are more difficult to control, reductions in vehicle use and miles traveled are needed to significantly reduce PM-10 emissions caused by suspended road dust.



Wood-burning stoves, fireplaces, and residential open waste burning are also a source of PM-10 emissions. Research on human health effects of PM-10 shows a correlation between elevated PM-10 concentrations and aggravation of chronic illnesses and elevated mortality rates. Fine particulate matter can affect health more than larger particles because it can bypass respiratory filtration systems and lodge deep in the lungs¹.

Overview of Arcata's air quality. Air quality is affected by both emissions and meteorological conditions. Arcata air quality is influenced by its coastal location and relatively stable temperatures throughout the year. Temperatures average 50 degrees Fahrenheit, with a yearly average range of 40-60 degrees Fahrenheit. Prevailing winds are from the northwest in summer and southwest in the winter. During winter months moderate temperatures, frequent fog, and moderate to heavy precipitation cause inversions which impact air quality.

Arcata is within the northwestern most air district in the State, the District, which encompasses 7,753 square miles including the counties of Humboldt, Del Norte, and Trinity, and serves a population of approximately 184,000. The District presently meets all federal and state air quality standards, except for the state standard for particulate matter of ten microns and smaller (PM-10). The table below shows the federal and state PM-10 standards.

TABLE AQ-1 AMBIENT AIR QUALITY STANDARDS FOR PM-10 EMISSIONS

AVERAGING TIME	FEDERAL STANDARD	CALIFORNIA STANDARD
Annual Arithmetic Mean	None	20 ug/m ³
24 Hour Average	150 ug/m ³	50 ug/m ³

Source: California Air Resources Board, Ambient Air Quality Standards, 2023. Note: ug/m³ = micrograms per cubic meter.

The District began measuring North Coast PM-10 concentrations in 1985. Of the total suspended particulates measured, PM-10 comprise approximately 60% of particulate matter. Table AQ-2 shows local PM-10 measurements.

TABLE AQ-2 PM-10 MEASUREMENTS IN THE ARCATA/EUREKA AREA

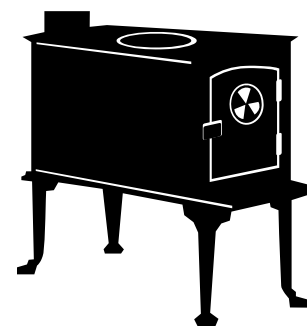
MONITORING LOCATION	MAX. 24 HOUR VALUE (ug/m ³)	ANNUAL AVERAGE (ug/m ³)
Eureka – Jacobs Station (2022)	55.0	17.21
Eureka – Jacobs Station (2021)	66.9	20.95
Eureka – Jacobs Station (2020)	171.6	21.61
Eureka – Jacobs Station (2019)	49.3	15.21

Source: California Air Resources Board AQMIS Database. All values are in ug/m³ = micrograms per cubic meter.

Humboldt County is classified non-attainment, while Del Norte and Trinity are classified as attainment. Between 2014 and 2019, the California PM-10 standard was only exceeded 12 times. Nine exceedances were due to wildfire events and three were attributed to woodstove burning (District 2022). Table AQ-3 shows general overall sources of pollution by major category.

The Chemical Mass Balance Study of Composition of Particulate Matter conducted in 1992 found that diesel emissions constituted a large component of PM-10. Diesel emissions have been declared a toxic emission by the State, and the State Air Resources Board is instituting a diesel engine replacement/retrofitting program. California adopted new regulations that will phase out diesel trucks by 2036.

District-wide, the number of days which exceed standards have decreased from about 24% in 1985 to 2% in 1997, and less than 1% in 2021. The months with highest PM-10 concentrations are generally December, January and February due to meteorological conditions and increased use of wood burning stoves and fireplaces.



Significance criteria for air contaminants. The District publishes Significance Thresholds for stationary sources of air contaminants (Regulation I, Rule 110). Emissions are considered significant (defined in terms of tons emitted per year) if a new or modified stationary source exceeds the values shown in Table AQ-4. There are no established significance criteria for mobile sources of emissions, but large projects (such as residential subdivisions and shopping centers) can be compared with stationary source criteria to identify the cumulative impacts of many mobile sources such as motor vehicles.

North Coast Unified Air Quality Management District Particulate Matter (PM-10) Attainment

Plan. As required by the California Clean Air Act, the District adopted a Particulate Matter (PM-10) Attainment Plan (Plan) in 1995 to identify major PM-10 sources and develop and implement control measures to meet state ambient air quality standards. The District's Plan established goals to reduce PM-10 emissions and reduce PM-10 levels to meet the California Ambient Air Quality Standards. Exceptions are made for uncontrollable events such as wildfires, structure fires, and unusually high winds. The plan includes three areas of recommended control

strategies to meet these goals: transportation, land use, and burning. The table below identifies the categories of measures included in each control strategy. The draft PM-10 attainment plan developed by the North Coast Unified Air Quality Management District was adopted May 11, 1995. Since that time, Del Norte and Trinity have reduced PM-10 to attainment status. Humboldt is still designated non-attainment.

TABLE AQ-3 EMISSIONS SOURCES AND CONTRIBUTION TO VARIOUS POLLUTANTS

SOURCE TYPE	EXAMPLES OF EMISSION CONTRIBUTORS
Industrial	pulp mills, sawmills, power plants, other heavy industry
Commercial	gas stations, restaurants, dry cleaners, body shops, etc.
Residential	home heating, residential open waste burning, solvent/ paint use, lawn equipment etc.
Mobile	cars, planes, trains, road dust and other transportation sources
Agriculture and Forestry	forest management burning, field burning, herbicide use, etc.

TABLE AQ-4 SIGNIFICANT EMISSION RATES FOR STATIONARY SOURCES (TONS/YEAR)

CONTAMINANTS	TONS PER YEAR
Carbon Monoxide	100
Nitrogen Oxides	40
Sulfur oxides	40
Particulate Matter (PM-2.5)	10
Particulate Matter (PM-10)	15
Ozone	40
Various Other Contaminants [1]	0.0004 to 10

Source: Regulation I of the District, Rule 110-(2015)

[1] Other contaminants include lead, asbestos, beryllium, mercury, vinyl chloride, fluorides, sulfuric acid mist, hydrogen sulfide, and reduced sulfur compounds. Contact District for detailed information on emission rates and significance criteria.

The control measures described above are included in the District's PM-10 Attainment Plan and provide additional measures to reduce air pollution emissions. The District has existing control measures for commercial, non-residential burning, industry, forestry and agricultural burning, and construction. These measures are not included in the attainment plan because emissions reductions resulting from them are already reflected in the air quality monitoring. This element's objectives and policies include many of the District's Plan's control measures, particularly for transportation and land use planning.

TABLE AQ-5 District CONTROL MEASURES

CATEGORY	CONTROL MEASURES
Transportation	Public transit, rideshare programs, park and ride lots, vehicle buy back and smoking vehicle programs, traffic flow improvements, bike routes.
Land Use	Pedestrian and transit oriented development, walkable communities, integration of land use and transportation planning.
Burning	Residential open waste burning restrictions, conventional fireplace replacements, improved woodstoves, new development requirements, woodstove curtailments on high smoke days, education, and home weatherization.

4.8 POLICIES

The Air Quality Element includes the following policies:

- AQ-1 Reduce Point and Area Sources of Air Pollutants
- AQ-2 Reduce Mobile Sources of Air Pollutants
- AQ-3 Regional Air Quality Standards, Monitoring, and Education
- AQ-4 Odor

POLICY AQ-1 POINT AND AREA SOURCES OF AIR POLLUTANTS

Objective. Improve air quality by reducing emissions from stationary point sources of air pollution (e.g., equipment at commercial and industrial facilities), and stationary area sources (e.g., wood-burning fireplaces and gas-powered lawn mowers), which cumulatively emit large quantities of emissions.

AQ-1a Reduce emissions from stationary point sources: commercial and industrial.

Coordinate with energy providers to develop incentive programs encouraging the use of less polluting, energy efficient designs and equipment in commercial and manufacturing uses. Encourage commercial and industrial uses to self-enforce emissions reductions by maintaining and repairing equipment, correcting leaks, installing control devices, and minimizing accidental releases. Coordinate with the District to establish buffer zones between point sources and the public, particularly sensitive receptors such as schools, hospitals, and convalescent facilities.

AQ-1b Reduce emissions from stationary area sources: residential, commercial, and industrial. Prohibit installation of wood burning appliances, including replacement, remodel, addition, or new construction. New construction retrofits must comply with energy efficient construction codes to reduce energy consumption including high-efficiency windows, water heaters, and furnaces. Encourage electric heat pump appliances.

AQ-1c Coordination between the District and Arcata Fire Protection District. The City will encourage Arcata Fire Protection District officials to coordinate with the District to develop procedures for identifying, monitoring, and informing the public of high pollutant incidents related to fires and accidental or intentional releases of toxic or unknown materials. Coordination should encompass current air quality levels, meteorological conditions (stagnant air), prevailing wind directions, location of nearby sensitive receptors, potentially affected land uses, and types of potential toxic materials. Coordination and required permits are particularly important during the planning and implementation of controlled burns.



AQ-1d Review of development projects for emissions reductions. Evaluate new construction plans to reduce point and area sources of pollution. Consult with the District during the environmental review process to ensure that:

1. Air quality impacts of development projects are assessed using analytical methods and significance criteria for emission rates approved by the District.
2. Air quality mitigation is feasible, workable, monitorable, and cost effective.
3. Impacts of projects that may be individually insignificant, but cumulatively significant are minimized or mitigated.
4. Innovative measures are incorporated into the project design to reduce air quality impacts.
5. The City shall require air filtration systems at new sensitive receptor buildings to be designed and constructed with air filters rated at a minimum efficiency reporting value (MERV) 13 or higher.

Encourage the District to enforce these measures and their related policies.

POLICY AQ-2 MOBILE SOURCES OF AIR POLLUTANTS

Objective. Improve air quality by reducing emissions from transportation sources, particularly motor vehicles, and other mobile sources. Reduce vehicle miles of travel and encourage shifts to alternative modes of travel.

AQ-2a Implement land use measures to reduce vehicle trips, miles traveled, and air pollutant emissions. Implement or encourage the land use and development measures which reduce motor vehicle travel as outlined in the Transportation Element. These measures are also effective in reducing mobile sources of air pollutants.

AQ-2b Implement transportation measures to reduce vehicle trips, miles traveled, and air pollutant emissions. Implement or encourage the following measures to reduce vehicle miles traveled and provide alternatives to the single occupant motor vehicle, as outlined in the Circulation & Mobility Element.

1. Provide as direct and safe a travel route as possible for all travel modes.
2. Implement and support public education programs explaining the negative impacts of single occupant vehicle use, and encourage the development of employer-based measures to reduce employee automobile travel.
3. Require Arcata & Mad River Transit System and encourage other fleet operators to convert vehicles to run on less polluting alternative fuels at the earliest feasible time (See Policy RC-8a).



AQ-2c Reduce or minimize the creation of “hot spots” or localized places of concentrated automobile emissions. Implement or encourage the following measures to reduce hot spots, which occur where groups of vehicles are required to idle (e.g., at congested intersections, driveways and drive-through facilities).

1. Minimize the delay and congestion at unsignalized and signalized intersections to reduce emissions from idling vehicles. Attempt to achieve this through reducing automobile travel, minor capacity improvements, or fine-tuning of intersection operations. Discourage major capacity improvements at intersections, minimize new signalized intersections, or any other improvement which discourages walking, bicycling, or transit use.
2. Minimize or restrict land uses with drive-through facilities located in areas of concentrated traffic or near congested intersections.
3. Construction of projects with large parking lots or high volume driveways shall identify traffic impacts and provide evidence that project design will optimize

internal circulation and minimize delay. Ensure that mitigation measures balance the needs of automobiles, pedestrians, bicyclists, and transit riders.

AQ-2d Design Arcata's highest traveled arterials to minimize stopping. Recognize that automobiles are most efficient and less polluting at constant, moderate speeds between 25 and 35 miles per hour. Minimize idling delay, excessive congestion, and excessive speeds with the following measures:

1. Encourage California Department of Transportation to coordinate traffic signals on Samoa Boulevard to maximize progression.
2. Eliminate traffic bottlenecks with traffic flow improvements (such as re-allocating turning lanes, or converting all-way stop control to roundabouts or two-way stop control), without impacting the safety of pedestrians, bicyclists, or transit facilities.
3. Review access plans for commercial driveways to ensure designs minimize idling vehicles and concentrations of traffic. For larger projects require multiple driveways rather than single driveways and consider turn restrictions where delays to existing driveways could be significant.
4. Encourage and support law enforcement's efforts to expeditiously manage traffic incidents.



AQ-2e Recognize that poor air quality is caused by the combination of high pollutant emissions and meteorological conditions that do not allow for dispersal of pollutants.

The City shall coordinate a joint effort with the District to minimize the impact of high pollutant incidents and notify the public about meteorological conditions that contribute to poor air quality. The joint effort shall include employing the following measures:

1. Implement added air pollution control measures during predictable meteorological events of stagnant air. Inform the public of high pollutant incidents and encourage measures which minimize impacts, such as limiting use of wood-burning fireplaces, gas powered equipment, and avoiding non-essential vehicle travel.
2. Promote and encourage employer-based and project-based Transportation Demand Measures (such as subsidized bus fare, flexible work hours, indoor bike storage, and incentives to carpool) to reduce automobile travel, particularly during periods of poor air quality.
3. Support and encourage local industrial and commercial efforts to reduce emissions and particulate pollution from industrial plants and trucks, particularly

- during periods of poor air quality.
4. Require traffic and construction site dust control measures at construction projects. Require measures which reduce emissions from construction activity and maximize efficiency of traffic flow during inversion conditions.

AQ-2f Enforce air quality control measures and monitoring at construction sites.

Construction emissions shall be controlled because, although they are temporary in nature, they can often be the greatest air quality impact of a project. Require dust and erosion control measures for construction activities.

AQ-2g Enforce air quality control measures and monitoring for agricultural operations. Air emissions from agricultural operations, including field burning, airborne soils, and over-spray from herbicide applications, shall be controlled and monitored through air quality standards, as well as adherence to the Land Use Code.

POLICY AQ-3 REGIONAL AIR QUALITY STANDARDS, MONITORING, AND EDUCATION

Objective. Participate in regional efforts to improve and monitor air quality and meet air quality goals, coordinate transportation and land use development planning with the North Coast Unified Air Quality Management District, and educate the public.

AQ-3a Air quality standards and monitoring. Identify potential emission sources of airborne toxins from mobile and stationary sources. This may be in coordination with the California Air Resource Board and the District, as appropriate. Enforce rigid high standards to restrict fumes, smoke, dust, or other environmental pollutants from stationary sources of pollution.

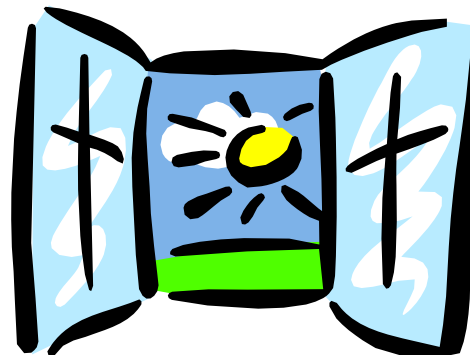
AQ-3b Develop and distribute material to educate the public on air quality issues. Work with Cal Poly Humboldt, the California Air Resources Board, and the District to develop educational material regarding air quality, impact of air quality on people, plants and animals, and what citizens can do to improve air quality. The City will make this information available.

AQ-3c Cooperation in enforcement activities and programs. Cooperate with the District in implementing and enforcing the district's rules and programs. Consider joint implementation of programs between the City and the district such as:

1. A voluntary wood-burning-devices dryness certification program.
2. Free cordwood moisture checks.
3. Brochures on wood burning.
4. Conversion of conventional wood burning devices to Environmental Protection Agency certified devices.
5. Use of district non-compliance funds for low-cost replacements.

Develop land use ordinances and guidelines for new residential development to limit wood burning devices. Use District strategies to identify improper wood burning device use, improperly dried fuel, and faulty equipment, and provide education to violators or take enforcement action.

AQ-3d Indoor air pollution. Factors such as sealed building interiors, inadequate ventilation, non-openable windows, and use of building materials that release toxic substances contribute to indoor air pollution. To maximize indoor air quality, the installation of openable windows and adequate ventilation systems, the use of pollution-reducing houseplants, as well as the selection of non-toxic building materials and interior finishes, is encouraged in all new buildings and in the retrofitting of existing buildings.



AQ-3e Greenhouse gas reduction. Many of the chemicals of concern for air quality are also greenhouse gases. The City shall work locally and regionally to develop plans and programs to reduce or reverse greenhouse gas emissions to meet State and Federal greenhouse gas reduction goals.

POLICY AQ-4 ODOR

Objective. Minimize public exposure to noxious odors from industrial, manufacturing, processing, and food and beverage production operations.

AQ-4a Odor controls. Identify potential sources of noxious odors and regulate those sources to avoid adverse effects on adjacent sensitive receptors. Noxious odors are defined as foul smelling airborne emissions that are sufficiently concentrated to cause physical discomfort to those inhabiting adjacent areas. Regulations imposed to reduce effects of these odors shall include limiting hours for odor emissions, periodic monitoring, and filtering to reduce concentrations.

4.9 IMPLEMENTATION MEASURES

#	IMPLEMENTATION MEASURE DESCRIPTION	RESPONSIBLE PARTY	TIME FRAME
AQ-1	Air quality education and air emissions reduction programs Continue monitoring local air quality and setting high standards for air quality. The City, including the Fire Department, shall work with the District to establish an air quality monitoring station in Arcata.	North Coast Unified Air Quality Management District	Ongoing

AQ-2	Funding sources for wood-burning appliance retrofits for low income and elderly Research and apply for grant funding for qualifying low-income and elderly households to retrofit wood-burning appliances that have high emission rates.	Community Development Dept.	Ongoing
AQ-3	Educational materials The City shall maintain a list of non-toxic building materials and interior finishes, provide available information about building techniques and designs that reduce or eliminate indoor air pollution, and encourage a good-faith effort by private industry to use those materials and techniques.	Community Development Dept	Ongoing
AQ-4	Climate Action Plan Adopt a Climate Action Plan and collaborate regionally to implement the plan.	Community Development Dept. and City Council	Year 1 and ongoing
AQ-5	Implement Construction Screening and Reduction of Toxic Air Contaminants Emissions (TACs) The City shall require applicants for development projects that would be located within 1,000 feet of an existing sensitive receptor to identify the construction schedule and, for projects that would require more than 12 months of construction, implement the following minimization measures to reduce potential Toxic Air Contaminants emissions. Measures to reduce risk from construction emission may include, but are not limited to: <ul style="list-style-type: none"> • During construction, use construction equipment rated as US EPA Tier 4 Interim for equipment of 50 horsepower or more. • During construction, use construction equipment fitted with Level 3 Diesel Particulate Filters for all equipment of 50 horsepower or more. 	Community Development and Engineering Departments	Year 1

Endnotes

1. For further information on the health effects of PM-10 see the California Air Resources Board publication "Facts about Air Pollution and Health" (ARB Publications Department); the EPA document [National Air Quality and Emissions Trends Report](#) (EPA Office of Air Quality Planning and Standards, Research Triangle Park, NC); the Air Resources Board December 1982 publication [California Ambient Air Quality Standards for Particulate Matter \(PM-10\)](#); Federal Register Vol. 62, No. 138, 1997 for information on PM-2.5; and Health & Environment Digest Vol. 10, No. 4 "Airborne Particulates: A Deadly Public Health Concern."